

Rhodora

JOURNAL OF THE
NEW ENGLAND BOTANICAL CLUB.

Conducted and published for the Club, by

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FRANK SHIPLEY COLLINS

MERRITT LYNDON FERNALD

HOLLIS WEBSTER

} Associate Editors.

WILLIAM PENN RICH

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Vol. 8.

July, 1906.

No. 91.

CONTENTS:

Violets of the District of Columbia. <i>H. D. House</i>	117
Notes on Algae,—VII. <i>F. S. Collins</i>	122
Some new or little known Cyperaceae. <i>M. L. Fernald</i>	126
Lists of New England Plants,—XIX. <i>J. F. Collins</i>	131
A Botanical Exhibition. <i>M. E. Cherrington</i>	135

Boston, Mass.

740 Exchange Building.



Providence, R. I.

Preston and Rounds Co.

RHODORA.—A monthly journal of botany, devoted primarily to the flora of New England. Price \$1.00 per year (\$1.25 to all foreign countries except Canada); single copies 15 cents. Volume 1, \$1.50. All remittances by check or draft, except on Boston or New York, must include ten cents additional for cost of collection. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be gladly received and published to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than one page of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscripts and proofs to

B. L. ROBINSON, Clement Circle, Cambridge, Mass.

Subscriptions, advertisements, and business communications to

W. P. RICH, 300 Massachusetts Avenue, Boston, Mass.

Single copies may be had from

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THE VIOLETS AND VIOLET HYBRIDS OF THE DISTRICT OF COLUMBIA AND VICINITY.

(Plates 71, 72.)

HOMER DOLIVER HOUSE.

DURING the seasons of 1904 and 1905, a survey of the violets of this region was undertaken by the writer with the object in view of ascertaining the status of certain peculiar forms, some already described as species and others recognized as hybrids, and further to discover if possible whether or not the supposed hybrids were consistent with the pure species found in their immediate neighborhood.

A careful field study was made of a large number of colonies, and sets representing my collections have been placed in the herbaria of the National Museum, New York Botanical Garden, Missouri Botanical Garden, Harvard University, Ezra Brainerd and H. D. House.

Practically all of the characteristics peculiar to violet hybrids as noted by Mr. Brainerd in recent articles, apply to those found in this vicinity. Moreover, not a single hybrid was found but that the parent species were immediately associated with it or were to be found within a few rods. A brief review of the methods of cross-fertilization of the violets shows that for two species to be crossed they must not only occur in the same region but must be cohabitant with each other or at most, occur within a few rods of each other. Another noticeable fact is that the most remarkable hybrids and variations always occur upon new soil, recently cleared land, embankments, along ditches, etc. — in short, in places the conditions of which are due to the work of man and not nature.

It is not necessary for the purposes of this article to redescribe species already well characterized in recent manuals, and the pure species may be named as follows:

1. *V. ODORATA* L., escaped from cultivation.
2. *V. BLANDA* Willd. (*V. LeConteana* G. Don). According to Mr. Brainerd (*RHODORA* 7: 248. 1905), the species heretofore called *V. LeConteana*, must now be referred to Willdenow's *V. blanda*.
3. *V. LANCEOLATA* L.
4. *V. PRIMULIFOLIA* L.
5. *V. PEDATA* L.
6. *V. PEDATA INORNATA* Greene (*V. inornata* Greene, *V. pedata lineariloba* DC.?).
7. *V. PALMATA* L.
8. *V. VESPERTILIONIS* Greene.
9. *V. ORNITHODES* Greene. Occurs sparingly at Cleveland Park and along the Potomac River above The District line.
10. *V. STONEANA* House. First described and figured by Witmer Stone as *V. septemloba*, from plants collected in Southeastern Pennsylvania. Found in abundance by the writer at Hyattsville and Patuxent and at Rockville by Mr. Jos. H. Painter.
11. *V. PAPILIONACEA* Pursh.
12. *V. FILICETORUM* Greene.
13. *V. SORORIA* Willd. Occurs abundantly in rocky places along the Potomac River above Washington and sparingly in other localities.
14. *V. AFFINIS* LeConte. (*V. obliqua* Hill?)
15. *V. VILLOSA* Walt.
16. *V. CUCULLATA* Ait. (Including *V. macrotis* Greene, and other segregates.)
17. *V. BRITTONIANA* Pollard. Related to *V. septemloba* LeConte, of the southern states and certainly distinct from it according to the unpublished plate of LeConte's and recent collections made in the south which agree with the original plate in having conspicuous runcinate lobes, an important character not found in *V. Brittoniana*.
18. *V. PECTINATA* Bicknell. Doubtfully distinct from *V. Brittoniana*, and apparently an entire-leaved form of it. One clump only was noted along with *V. Brittoniana* at Riverdale.
19. *V. FIMBRIATULA* J. E. Sm.
20. *V. SAGITTATA* Ait.
21. *V. EMARGINATA* (Nutt.) LeConte.

22. *V. SCABRIUSCULA* Schwein. Along the River bottoms of the Potomac River above Washington.

23. *V. PUBESCENS* Ait. Great Falls, Md., Fairfax Co. and Bluemont, Va.

24. *V. CONSPERSA* Reichenb. (*V. Muhlenbergii* Torr., *V. labradorica* Authors, probably not of Schrank.) Rock Creek Park and toward Great Falls.

25. *V. STRIATA* Ait. Common along the River bottoms and Canal banks above the city of Washington.

26. *V. RAFINESQUII* Greene.

In addition to this list, the following forms have been described from this region, the exact status of which I have not had the opportunity to determine: *V. lacteocaerulea* Greene, *V. filicetorum* var. *parthenica* Greene, *V. emarginata* var. *simulata* Greene, and *V. fontana* Greene.

The recognized hybrid forms are best given in alphabetical order as follows. All specimens cited by number or date unless otherwise stated were collected by the writer.

Viola affinis* × *papilionacea hyb. nov. At Woodridge, D. C., on a moist wooded hillside is a large colony of *V. affinis* (No. 651), and at the base of the hill in a meadow, *V. papilionacea* is abundant. When first seen (May 3d) there was noticed an abundance of what seemed to be a darker and broader-leaved form of *V. affinis*, growing lower down on the hillside than *V. affinis*. The intermediate characters of the leaves and flowers indicated its hybrid origin which specimens in fruit gathered later (June 15th) showed to be true. The abortive capsules were distinctly pubescent and the plant much larger than typical *V. affinis*.—Woodridge, D. C., May 3d, 1905 (No. 652) and June 15, 1905. Type in herb. H. D. House.

VIOLA AFFINIS* × *SAGITTATA Brainerd, *RHODORA* 8: 55. 1906.—Patuxent, Md. June 4, 1905 (No. 972, type).

VIOLA AFFINIS* × *VILLOSA Brainerd, *RHODORA* 8: 56. 1906.—Rock Creek Park, May 13, 1905 (Nos. 702, 705, 710); Glen Echo, May 17, 1905 (No. 733); Kensington, June 11, 1905 (No. 1003); Glen Carlyn, Va., June 25, 1905 (No. 1053, in part).

VIOLA BRITTONIANA* × *CUCULLATA House, Bull. Torrey Club 32: 255, pl. 17. 1905. *V. notabilis* Bicknell, *Torreyana* 4: 131. *V. cucullata* × *septemloba* Brainerd, l. c. 52.—Riverdale, Md., June 8, 1905 (No. 988, in part).

Viola Brittoniana \times **emarginata** nom. nov. *V. emarginata* \times *septemloba* Brainerd, RHODORA 8: 53. 1906.—One of the oddest of violet hybrids, growing in dense matted clumps and showing a great diversity in leaf outline. (PLATE 71.) Hyattsville, May 7, 1905 (No. 683), June 4, and Sept. 25, 1905 (No. 937).

Viola Brittoniana \times **sagittata** nom. nov. *V. sagittata* \times *septemloba* Brainerd, l. c. 51, pl. 66, a & b.—Riverdale, May 1, 1905 (No. 639, type), and June 8, 1905 (No. 989).

VIOLA CUCULLATA \times **EMARGINATA** Brainerd, RHODORA 8: 53. 1906. Hyattsville, Sept. 25, 1905 (No. 1637).

VIOLA EMARGINATA \times **FIMBRIATULA** Brainerd, RHODORA 8: 57. 1906. Woodridge (Near District Line), June 15, 1905 (No. 649, in part).

Viola emarginata \times **papilionacea** hyb. nov. Early leaves triangular, cucullate, cordate, glabrous, very small; flowers small, pale purplish-blue, about 1 cm. broad, with dark blue center and conspicuous purple veins; later leaves large, triangular, truncate or shallowly cordate, pale green, margins crenate-serrate toward the apex, deeply dentate or cut-toothed at the base, capsules about 6 mm. long or less on ascending peduncles, abortive, those from the petaliferous flowers apparently never developing.—Takoma Park, July 30, 1904 (No. 141), Aug. 25, 1904 (No. 334, type), Apr. 23, 1905 (No. 606), Oct. 4, 1905 (No. 1645).

VIOLA EMARGINATA \times **SAGITTATA** Brainerd, RHODORA 8: 58. 1906.—North Takoma (Nos. 140, 142, 905); Hyattsville (Nos. 1638, 1647); Glen Carlyn, Va. (No. 1047).

Viola emarginata \times **villosa** hyb. nov. Leaves with the general outline of *V. emarginata* but smaller, shallowly lobed or toothed at the base, pubescent above with the conspicuous whitish hairs of *V. villosa*. Growing with both of these species at Takoma Park, May 2, 1905 (No. 646, type).

VIOLA FIMBRIATULA \times **PAPILIONACEA** Brainerd, RHODORA 8: 54. 1906. *V. fimbriatula aberrans* Stone, Proc. Phila. Acad. 1903: 683. pl. 37. f. 4-6. 1903.—Riverdale, Sept. 26, 1904 (No. 538), Sept. 25, 1905 (No. 1608); Darlecarlia Reservoir, June 17, 1905 (No. 1026, 1027).

VIOLA FIMBRIATULA \times **SAGITTATA** Brainerd, RHODORA 8: 57. 1906.—The most abundant violet hybrid of this vicinity and occurring almost everywhere that the two species, *V. fimbriatula* and *V.*

sagittata are found near together. Extremely diverse in leaf-outline and many of the intermediate forms are highly fertile, producing normal capsules and potent seeds.

***Viola fimbriatula* × *villosa* hyb. nov.** Leaves oblong-ovate, strongly but rather distantly crenate, cordate, obtuse, sparingly pubescent on the petioles and under surface of the leaf-blades, strongly pubescent above with rigid, whitish hairs peculiar to *V. villosa*, deep-green but faintly mottled with whitish by the darker green regions of the principal veins, the abortive capsules on spreading peduncles.—Takoma Park, Aug. 3, 1904 (No. 143a, type).

VIOLA PALMATA* × *VILLOSA Brainerd, *RHODORA* 8: 56. 1906.—Four-mile-run, Va., *Jos. H. Painter*, Aug. 5, 1904 (No. 865); *H. D. House*, Aug. 9, 1904 (No. 182); Darlecarlia Reservoir, May 23, 1905 (No. 804); Glen Echo, May 25, 1905 (No. 823); Rock Creek Park, May 13, 1905 (No. 712); Fairfax Co., Va., June 29, 1905 (No. 1079).

VIOLA PAPILIONACEA* × *SAGITTATA Brainerd, *RHODORA* 8: 54. 1906.—This was referred to by me as *V. conjugens* Greene, in a previous article on the violets of New Jersey (*Bull. Torrey Club* 32: 256. 1905), and a subsequent comparison of the New Jersey specimens with the type of *V. conjugens*, shows that they are the same. As *V. conjugens* was described from Anne Arundel Co., Md., it comes within the range of this paper.

***Viola papilionacea* × *villosa* hyb. nov.** Mature leaf-blades oblong-ovate to suborbicular, obtuse, obscurely crenate toward the apex, more conspicuously serrate at the base, cordate, deep-green, nearly glabrous, especially beneath but the blades more or less pubescent above with whitish hairs, capsules abortive on spreading peduncles. Growing with the two species, *V. papilionacea* and *V. villosa* at Darlecarlia Reservoir, June 17, 1905 (No. 1029, type).

***Viola Stoneana* × *villosa* hyb. nov.** Growing in dense, matted clumps, the leaves at flowering time spreading on petioles 5 to 10 cm. long, pubescent above with the silvery whitish hairs characteristic of *V. villosa* and even more strongly ciliate on the margins than *V. Stoneana*, nearly glabrous beneath and somewhat shining; size of plant and lobing of the mature leaf-blades exactly intermediate between the two species and growing with them. Flowers intermediate in color between the blue of *V. Stoneana* and the deep purple of *V. villosa*. (PLATE 72.)—Hyattsville, May 5, 1905 (No. 685, type), June 4, 1905 (No. 935a).

In addition to these forms which considerable field study of their habit and surroundings have shown to be unmistakably of hybrid origin and in which, for the most part, it has been easy to determine from what species they have been derived, there are many uncertain forms in need of further study. Among them may be noted what seems to be a triple hybrid between *Viola (fimbriatula × papilionacea)* and *Viola emarginata*, at Takoma Park, July 23, 1904 (No. 95).

CLEMSON COLLEGE, South Carolina.

EXPLANATION OF PLATES.

PLATE 71. *Viola Brittoniana × emarginata* House. (Natural size.) *a.* Flowering plant. *b.* Mature leaf. *c.* Cleistogamous flowers. *d, e.* Capsules from cleistogamous flowers.

PLATE 72. *Viola Stoneana × villosa* House. (Natural size.) *a.* Flowering plant. *b.* Mature plant. *c.* Cleistogamous flower. *d.* Capsule from cleistogamous flower.

NOTES ON ALGAE,—VII.

F. S. COLLINS.

IN this number of the Notes are included records of various species, etc., new to our flora; also a few items of interest in regard to previously recorded species; unless otherwise indicated, all were collected by the writer.

PHORMIDIUM RETZII (Ag.) Gomont forma FASCICULATUM (Bréb.) Gomont, Monogr. des Oscill., p. 197. The typical *P. Retzii* is a widely distributed species, and is common in sluggish waters throughout New England, in the form of rather firm coatings, from one half to one cm. thick, on stones and other objects. When the current is rather brisk, these coatings sometimes fringe out into narrow strings, but the extreme form appears to be unusual. It was found by the writer in quite rapid water, in Lynnfield, Mass., June 11, 1905. There was a distinct stipe-like part, flattened, expanding above into a broader lamina, repeatedly dividing, and ending in innumerable long, slender,

pointed, free or entangled strings, waving actively in the current. The stipe was dark brown, the lamina and its divisions were intense blue-green; sometimes such a frond had a length of 60 cm., and a very curious resemblance in habit to one of the digitate *Laminarias*. It was distributed in Collins, Holden & Setchell, *Phycotheca Boreali-Americana*, No. 1254.

LYNGBYA AESTUARI (Mert.) Liebmann and *L. SEMIPL*ENA (Ag.) J. Ag., are found as marine algae the world over, except in arctic and antarctic regions; the former has been found occasionally in fresh water in Europe, but apparently not in this country; both grew abundantly in an old claypit at West Cambridge, Mass., Aug. 6, 1905. *L. aestuarii* from this locality has been distributed as P. B.-A., No. 1255.

CALOTHRIX STAGNALIS Gomont, *Journal de Botanique*, Vol. IX, p. 197. Forming stellate tufts on various filamentous algae in standing water, Medford, Mass., in August, 1903. It is one of the few distinctly epiphytic species of the genus; the filaments, seldom exceeding a millimeter in length, are 8–10 μ in diameter at the middle, tapering to a fine hair above, somewhat thickened at the decumbent base. The sheath is thin and transparent, the trichome aeruginous, distinctly torulose, with cells about as long as broad. There are two basal heterocysts, yellowish, spherical or subquadrate, and above them, in the mature plant, a sub-cylindrical spore, 12–14 μ diameter, 2–4 diameters long; rarely two spores occur. Spores have been reported as produced under culture in a marine species of *Calothrix*, but *C. stagnalis* was the first in which spores were found under normal conditions. Apparently the only record up to the finding of the American locality, as above, is that for the original station near Angers, France. Distributed as P. B.-A., No. 1114.

ENDODERMA VIRIDIS (Reinke) Lagerheim, *Öfversigt Vet. Akad. Forhandl.*, p. 74, 1883. The only species of *Endoderma* hitherto known in America is *E. Wittrockii* (Wille) Lagerh., which is not uncommon in various brown algae on the New England coast. In September, 1883, the writer collected at Falmouth, Mass., a specimen of *Seirospora Griffithsiana* Harv., and on examining it under the microscope found in the older parts a green endophyte which he could not identify at the moment, and a memorandum was made to look it up when convenient. It was not until the present year that the matter was again taken up; and it was found that the plant agrees with description and figures of *E. viridis*. The filaments are more slender

than those of *E. Wittrockii*, averaging 6 μ diameter; the branching is more abundant and irregular; the cells vary from one to six diameters long, and are quite irregular in form, not nearly cylindrical, as in *E. Wittrockii*. A good figure will be found with the original description as *Entocladia viridis* Reinke, in Bot. Zeit., p. 476, Pl. VI, 1879. In Europe it has more southern range than *E. Wittrockii*.

ACROCHAETE REPENS Pringsheim, Abh. Königl. Akad. Wiss., Berlin, p. 4, Pl. II, 1862. In this paper on the morphology of marine algae, Pringsheim published two nearly related genera of green algae, *Acrochaete* and *Bolbocoleon*, both growing in the tissue of brown algae, at the island of Helgoland. In each there is a more or less branched filament, creeping among the cortical cells of the host, and bearing very long and slender bristles, which project beyond the surface of the host; but the character of the bristles is different in the two. In *Acrochaete* they arise each from the terminal cell of a short lateral branch; in *Bolbocoleon* the hair projects from a specialized nearly empty cell; this is partitioned off from the vegetative cells, and has a relatively large bulbous base to the long sheath. *Bolbocoleon piliferum*, the original and only species, has been found to have quite a wide distribution, but *Acrochaete repens* seemed to be limited to a small district in northern Europe. It was therefore interesting to find it occurring in considerable abundance at Wood's Hole, Mass., Sept. 1, 1905, in fronds of *Chorda Filum* (L.) Stack., the host plant of the original station. Distributed as P. B.-A., No. 1279.

BRYOPSIS HYPNOIDES Lamouroux, Journal de Botanique, p. 135, 1809. While there have been occasional reports of the occurrence of this species on the New England coast, the writer has failed to obtain specimens confirming them, and it has seemed probable that all should be referred to *B. plumosa* (Huds.) Ag. A specimen from the herbarium of Capt. N. Pike, marked *B. hypnoides*, is evidently *B. plumosa*. Recently Mr. J. A. Cushman submitted to the writer a small collection of algae from Horseneck Beach, near New Bedford, and in this collection was a single specimen agreeing perfectly with European specimens of *B. hypnoides*. This was of course enough to give the species a place in our lists; and in May, 1905, it was found washed ashore at Mattapoisett, Mass., in sufficient quantity for it to be distributed as P. B.-A., No. 1286. Unfortunately some plants varied considerably from the type in the direction of *B. plumosa*. In *B. hypnoides* the branches of successive orders decrease gradually in size, those of each order being arranged spirally about their axis; in

B. plumosa the ramuli are bifarious and plumose, the distinction between branches of successive orders being quite marked. We certainly have both types; more investigation will be needed to make sure where specific lines should be drawn. Indeed, all the species of *Bryopsis* are vague in their limitations.

STREBLONEMA PARASITICUM (Sauv.) De Toni, Syll. Alg., Vol. III, p. 575; *Ectocarpus parasiticus* Sauvageau, Journal de Botanique, Vol. VI, p. 82, Pl. III. A very small plant with irregular basal filaments penetrating the tissue of the host and sending out short, simple filaments with cells 6–8 μ diameter and about one and a half diameters long; also slender hairs and subcylindrical, mostly biseriate, plurilocular sporangia. In Europe this species occurs in *Cystoclonium purpurascens* (Huds.) Kütz., *Gracilaria compressa* (Ag.) Grev., and *Ceramium rubrum* (Huds.) Ag. It has been found here only in *Cystoclonium purpurascens*, in the main stems and larger branches of well grown plants; where the endophyte is abundant the natural red color is changed to a dull yellow. It has been collected at Harpswell, Maine, and at Wood's Hole, Mass.; probably it occurs wherever the host plant is found.

STREBLONEMA OLIGOSPORUM Strømfelt, Om Algvegetationen i Finlands sydvestra Skärgård, p. 133, Pl. I, fig. 5. Another minute endophytic plant, with a basal layer of somewhat contorted, freely branching filaments, composed of rather irregular cells usually 10 μ long, 5–10 μ diameter; from these arise simple, cylindrical branches, about 5 μ diameter, ending in colorless, articulate hairs, which project beyond the surface of the host; also uniseriate plurilocular sporangia, usually cylindrical, 25–40 by 8–15 μ , occasionally shorter and ovate-lanceolate in outline. This species was first found in Iceland, where it occurred in the tissue of *Coilonema Chordaria* Aresch.; a plant found at Bailey's island, Casco Bay, Maine, appears to be identical, although occurring in a different host, in this case, *Gloiosiphonia capillaris* (Huds.) Carm. While resembling the preceding species, it seems to be distinct; in *S. parasiticum* the basal filament bears, in addition to the hairs, short vegetative filaments and sporangia of about the same height; in *S. oligosporum* the hairs are borne at the ends of the branches, which are fewer in number and much longer than the sporangia.

ASPEROCOCCUS ECHINATUS (Mert.) Grev. var. VERMICULARIS (Griff.) Harvey, Manual of the British Algae, p. 35. In place of the rather coarse, pipe-stem-like fronds of the type, the fronds in this

variety are hardly more than setaceous; up to 40 cm. long, with a diameter of about one millimeter; the sori show a tendency to an arrangement in rings about the frond. Found in a tide pool at Cedar Ledge, Casco Bay, Maine, July 15, 1904.

MALDEN, MASSACHUSETTS.

SOME NEW OR LITTLE KNOWN CYPERACEAE OF EASTERN NORTH AMERICA.

M. L. FERNALD.

Recent studies in various genera of *Cyperaceae* in the eastern United States and adjacent Canada have made it necessary to recognize a number of undescribed species and varieties in our flora and to alter the current interpretation of some others. These items which have been accumulating for some years are here brought together as a series of notes arranged in the sequence of the genera and species as now understood by the writer.

CYPERUS DENTATUS Torr. Fl. 61 (1824) was based upon *C. parviflorus* Muhl. Gram. 19 (1817), not Vahl. To the characterization of Muhlenberg's plant with the "Habitat ad ripas Susquehannae. . . . etiam in N. Anglia",¹ and with "Spiculis 3 compressis alternis ovatis, 8-floris,"² Torrey added "Spikes. . . appearing dentate or pectinate by the spreading of the points of the glumes when old";³ thus indicating very clearly a plant which occurs on sandy shores from central Maine to western New York and southward at least to West Virginia. This characteristic plant with prominent scale-tips varies in the number of flowers from 5 to 13, and the spikelets are very often altered to leafy tufts. An extreme development of the plant which is more common in certain portions of southern New England than typical *C. dentatus* may be distinguished as

C. DENTATUS, var. *ctenostachys*, n. var. Spikelets 15-40-flowered, the scale-tips less prominent.—MASSACHUSETTS, West Pond, Plymouth, September 23, 1863 — type, September 13, 1853 (*Wm. Boott*); Middleborough Pond, September 9, 1870 (*Wm. Boott*); margin of

¹, ², Muhl. Gram. 19 (1817).

³ Torr. Fl. 61 (1824).

pond, Centreville, August 5, 1901 (*Clara Imogene Cheney*): NEW JERSEY, pine barrens, without definite locality (*Gray, Gram. & Cyp.* no. 71, in part); swamps near Atsion, September 26, 1867 (*C. F. Parker*).

Usually producing fewer bulblets than *C. dentatus*, and in its elongate spikelets and less prominent scale-tips appearing quite distinct. Numerous transitional specimens occur, however, and both extremes are sometimes mixed on the herbarium-sheets under one label; for example, Dr. Gray's New Jersey material in the Gray Herbarium and Mrs. Cheney's sheet of Centreville plants in the Herbarium of the New England Botanical Club.

CYPERUS hystricinus, n. sp. Perennial by short branching rootstocks: the slender smooth rigid culms 2 to 5 dm. high, rising from hard corm-like bases, much exceeding the stiff narrow (2 to 5 mm. broad) smooth leaves: umbel of 3 to 10 smooth simple spreading-ascending rays, mostly shorter than the involucre: spikelets 1-2-flowered, subulate, rigid, 3 to 7 mm. long, densely crowded in cylindric or narrowly obovoid heads (1 to 2.5 cm. long), strongly reflexed, golden brown at maturity: scales closely appressed, the fertile strongly nerved, the terminal involute-subulate: achenes linear-cylindric, 2 to 2.5 mm. long.—NEW JERSEY, sandy fields, near Haddonfield, October 13, 1867 — type (*C. F. Austin*): PENNSYLVANIA, near Philadelphia, 1862 (*C. E. Smith*): MARYLAND, sandy fields, Salisbury, August, 1894 (*W. M. Canby*): GEORGIA, dry sandy soil south of Americus, July 20, 1901 (*R. M. Harper*, no. 1131).

Usually confused in the herbarium with *C. retrofractus* (L.) Torr., which has the culms scabrous at least above, the leaves short-pubescent, the few rays of the umbel mostly upright and longer than the involucre, and the spikelets in a conspicuously turbinate head. The differences between this plant and *C. retrofractus* were known to the late Charles E. Smith, whose specimens are accompanied by detailed notes indicating that the "rough" plant, *C. retrofractus*, is earlier mature than the smooth *C. hystricinus*.

CYPERUS dipsaciformis, n. sp. Perennial from corm-like bases: culms scabrous at least above, 2.5 to 8 dm. high: leaves shorter than the culms, scabrous-hispid above, 4 to 9 mm. wide: umbel 4-12-rayed, some of the ascending rays often equalling the involucre: spikelets 1-3-flowered, subulate, rigid, 6 to 11 mm. long, crowded in cylindric or subcylindric heads (1.5 to 4 cm. long), strongly reflexed, yellow-brown at maturity: fertile scales with green midribs: achenes 3 mm. long.—DELAWARE, woods, New Castle County, and near Wilmington, 1864 (*W. M. Canby*): DISTRICT OF COLUMBIA, along Rock Creek, Washington, 1868 (*F. Pech*); "in collibus siccis, apricis,

haud frequens", Washington, July, 1888 (*Th. Holm*); sandy thickets, near Washington, July 22, 1896 — type (*E. S. Steele*): VIRGINIA, Bedford County, August 1, 1871 (*A. H. Curtiss*): KENTUCKY, Pine Mountain, Harlan County, August, 1893 (*T. H. Kearney, Jr.*, no. 222): NORTH CAROLINA, sandy ground, Swain County, July 26, 1891 (*Beardslee & Kofoid*); sandy soil, Biltmore, June 22, 1897 (Biltmore Herb. no. 2134b): GEORGIA, Rome, July, 1888 (*Gerald McCarthy*); Stone Mountain, DeKalb County, July 3, 1893 (*J. K. Small*); dry woods, Athens, June 20, 1900 (*R. M. Harper*, no. 18).

Resembling *C. hystricinus*, but larger, with less developed rootstock, harsh leaves and culms, longer spikelets, scales with prominent green midribs, and longer achenes. From *C. retrofractus*, with which it has likewise been confused, clearly separated by its cylindric rather than turbinate-obovoid heads, browner spikelets, smooth rays, and much less developed rootstock. This is apparently the plant figured in Britton & Brown's Illustrated Flora (fig. 567) as *C. retrofractus*. The latter species which was *Scirpus retrofractus* L. Sp. 50 (1753) was based upon a figure of Plukenet's¹ which shows clearly a coarse plant with strongly turbinate heads, such as occur in a species which is well known from New Jersey to Florida and Texas, and northward in the low country to Missouri.

CYPERUS FILICULMIS Vahl, Enum. ii. 328 (1805) from Carolina was described as having the spikelets 10-flowered, and the scales yellowish on the sides. These characters both of color and number of flowers are found in Carolina specimens and in general in plants of the southeastern states where *C. filiculmis* has the spikelets 1 to 1.6 cm. long, with 8 to 12 flowers, the scales rather thin and yellow-tinged. This plant is common in the southern states but apparently rare in the North where its limits seem to be Iowa, the Mohawk Valley, New York, and Middlesex County, Massachusetts. The common plant of the northern states and adjacent Canada differs in some rather important regards from the typical plant of the South and it is here proposed as

C. FILICULMIS, var. **macilentus**, n. var. Spikelets 3 to 8 mm. long, 4 8-flowered: scales firm, greenish: achenes slightly smaller than in the species.—Dry or sandy open soil, Maine to Ontario, south to Virginia, Ohio, and Illinois. A common plant of which the following, from among numerous specimens, are representative. MAINE, Orono, July 26, 1895 (*M. L. Fernald*, no. 343) — type: NEW HAMP-

¹ Plukenet, Phyt. t. 415, fig. 4 (1742).

SHIRE, Hampton, September 22, 1901 (*B. L. Robinson*, no. 769): VERMONT, Johnson, August 10, 1893 (*A. J. Grout*): MASSACHUSETTS, Plymouth, September 6, 1873 (*Wm. Boott*): RHODE ISLAND, Cumberland, September 13, 1903 (*J. M. Greenman*, no. 1775): CONNECTICUT Southington, July 25 and September 24, 1895 (*C. H. Bissell*, no. 699): NEW YORK, western part of state (*Gray*, Gram. & Cyp., no. 74): VIRGINIA, Franklin, Southampton County, June 9–29, 1893 (*A. A. Heller*, no. 1031): ONTARIO, Point Colborne, July 19, 1901 (*J. Macoun*, no. 34,476): OHIO, vicinity of Wade Park, Cleveland, July 9, 1896 (*J. M. Greenman*, no. 143): MICHIGAN, Fort Gratiot, July 20, 1870 (*H. Gillman*, no. 36): WISCONSIN, Dells of the Wisconsin, August, 1858 (*I. A. Lapham*).

This northern plant with short spikelets and firm green scales seems in its extreme form very distinct from the typical *Cyperus filiculmis* of the South, but some specimens occur with few flowers but yellow-tinged thinnish scales, others with numerous flowers and firm scales.

ELEOCHARIS CAPITATA (L.) R. Br., var. **dispar** (E. J. Hill), n. comb. *E. dispar*, E. J. Hill, Bot. Gaz. vii. 3 (1882).

This local plant of Lake County, Indiana, has of late been treated as identical with the tropical and subtropical *E. capitata*, which occurs along the Gulf of Mexico and in Florida and extends northward along the coastal plain to Maryland. In its essential characters the material from northern Indiana cannot be separated from the southern plant; but *E. capitata* has whitish-brown scales and jet-black achenes, while *E. dispar* has the scales purple-brown and the achenes purple-black. These color characters hold in the twelve Indiana specimens before me and on this account the plant seems worthy recognition as an extreme extralimital variation from the tropical and subtropical type.

ELEOCHARIS **nitida**, n. sp. Perennial from a slender rootstock: culms capillary, 4-angled, striate, 2 to 8 cm. high: tips of the upper sheaths whitish: spikelet oblong-ovoid, acutish, 2.5 to 4.5 mm. long, 1.5 to 2.5 mm. thick, 8–20-flowered: scales elliptic-oblong, with rounded tips, purplish-brown, with greenish ribs and very narrow scarious margins, the lowermost 1 to 1.2 mm. long: achenes whitish-straw-color, narrowly obovoid, sharply trigonous, very minutely (under a lens) roughened, 0.7 to 1 mm. long; the very narrow crown-like tubercle with a short point in the middle.—QUEBEC, springy place, at border of swamp, Parker's Station, Pontiac County, June 3, 1903 (*J. Macoun*).

This beautiful little plant has been collected by Professor Macoun only at the original station on the Pontiac and Pacific Railway in the

Ottawa Valley, and he writes of it "What struck me particularly about it was its early maturity, and its short wiry stems which had a tendency to fall over. . . . The habitat I noted particularly as I was walking around collecting other species when I was struck with the maturity of this *Eleocharis* so early in the season, June 3rd." *E. nitida* is nearest related to *E. tenuis* (Willd.) Schultes, from dwarf specimens of which it differs in the whitish not dark-girdled tips of the upper sheaths, the narrow-margined smaller scales, the outer broad-margined scales of *E. tenuis* being 2 or 3 mm. long; the tiny sharp-angled whitish achenes with minute papillae, the larger achenes of *E. tenuis* being golden-yellow or orange-brown, becoming drab in age, obtuse-angled, and conspicuously papillose-roughened; and the very minute pointed tubercle.

ELEOCHARIS INTERMEDIA (Muhl.) Schultes, var. **Habereri**, n. var. Bristles absent or rudimentary.—NEW YORK, sandy shores of Oneida Lake, Vienna, Oneida County, August 2 and 18, 1900 (*J. V. Haberer*, no. 1149a).

Of this plant Dr. Haberer wrote "All of this material has bristles fugaceous or *none*. Out of much material I find I have but 3 with bristles. . . . It is somewhat curious that the plants within the influence of water — subject to inundation — are liable to be *minus bristles*." This lack of bristles in certain species or varieties is frequent in *Eleocharis*, *Scirpus*, and *Rynchospora*, all or essentially all plants of a lake- or river-system being constant in this character. Thus the now well-known *E. diandra* Chas. Wright constantly lacks bristles throughout the length of the Connecticut Valley, about Oneida Lake and in the Androscoggin Valley. Nearly all the *E. Engelmanni* about Winter Pond in Winchester, Massachusetts, belongs to the bristleless var. *detonsa* Gray. *E. palustris*, var. *calva* (Torr.) Gray, so far as known to the writer, is a very local plant, though material is often collected at certain stations. All the *Scirpus debilis* about Lake Massapoag in Sharon, Massachusetts, is var. *Williamsii* Fernald, without bristles; and in a few regions — the Kennebec Valley, Maine, Lake County, Indiana, etc.—*Rynchospora capillacea* consistently lacks the perianth and is var. *leviseta* Hill.¹

¹ For further comments on this point see RHODORA, iii, 250 (1901).

PRELIMINARY LISTS OF NEW ENGLAND PLANTS,—XIX.

J. FRANKLIN COLLINS.

[The sign + indicates that an herbarium specimen has been seen;
the sign — that a reliable printed record has been found.]

BUXBAUMIACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Buxbaumia aphylla</i> L. (1757)	+	+	+	+	+	+
“ <i>indusiata</i> Brid. (1826)		+	+			
<i>Diphyscium sessile</i> (Schmid.) Lindb. (1863) . .	+	+	+	+	+	+

GEORGIACEAE.

<i>Georgia pellucida</i> (L.) Rabenh. (1848) . . .	+	+	+	+	+	+
“ “ <i>var. curvata</i> Lindb.	+			+	+	
“ <i>geniculata</i> (Girgens.) Lindb. (1872) . .				+		
<i>Tetradontium Brownianum</i> (Dicks.) Schwaeg. (1824)						
“ <i>var. rigidum</i> (Funck) Jur. (1882)	+	+				

POLYTRICHACEAE.

<i>Catharinaea angustata</i> (Brid.) Brid. (1819) . .	+	+	+	+	+	+
“ <i>crispa</i> James (1855)				+		
“ <i>undulata</i> (L.) W. et M. (1803)	+	+	+	+	+	+
<i>Pogonatum alpinum</i> (L.) Röhl (1812)						
“ <i>var. arcticum</i> (Sw.) Brid. (1827)	+	+	+	+		
“ <i>brevicaule</i> (Brid.) P. B. (1805)	+	+	+	+	+	+
“ <i>capillare</i> (Mx.) Brid. (1827)	+	+	+	+		
“ <i>urnigerum</i> (L.) P. B. (1805)	+	+	+	+		
<i>Polytrichum commune</i> L. (1753)	+	+	+	+	+	+
“ “ <i>var. perigoniale</i> (Mx.) Br. Eur. (1844)	+	+		+	+	+
“ “ <i>var. uliginosum</i> Hüben. (1833)	+	+			+	
“ <i>formosum</i> Hedw. (1801)				+		
“ <i>gracile</i> Dicks. (1798)		—	+	—		
“ <i>Jensenii</i> Hagen (1898)	+					
“ <i>juniperinum</i> Willd. (1787)	+	+	+	+	+	+
“ <i>ohioense</i> R. et C. (1885)	+	+	+	+	+	+
“ <i>piliferum</i> Schreb. (1771)	+	+	+	+	+	+
“ <i>Smithiae</i> Grout (1903)			+			
“ <i>strictum</i> Banks (1798)	+	+	+	+	+	+

NOTES ON THE PRECEDING LIST.

Georgia pellucida var. *curvata* probably occurs throughout New England. It is here interpreted in its extreme form, with the strongly curved capsules. A close series of intergrades between this and the species is common; sometimes they all occur in the same colony. Its claims for varietal rank may be questioned.

Pogonatum aloides (Hedw.) P. B. (1805) was reported from western Massachusetts in 1833 by Prof. E. Hitchcock, and from Rhode Island in 1846 by S. T. Olney. No record of its occurrence in North America has been found since the latter date. It is not mentioned in Gray's Manual of 1848 (nor in subsequent moss manuals) although *P. brevicaulis*, a common New England species which is not given in Hitchcock's list, is there described. It is quite apparent that the *P. aloides* of this list should be referred to *P. brevicaulis*, as the latter was taken up in subsequent lists of western Massachusetts and the former dropped. This is certainly the case with the Rhode Island plant mentioned, for in 1847 Olney corrected his own error of the preceding year.

Pogonatum alpinum. Linnaeus, in his Species Plantarum, II, 1109 (1753), indicates the plant illustrated by Dillenius in his Historia Muscorum (tab. 55, fig. 4) as the one to which his name of *Polytrichum alpinum* applies. This plant, as there figured, is considerably branched and the capsules are elliptic in longitudinal section — at most only twice as long as wide. The same statement will hold true for this species as figured in the Bryologia Europaea (tab. 418), in Dixon's Handbook of British Mosses (Ed. 2, tab. 10. B.) and in other recent works, as well as for (presumably) authentic herbarium material of the European plant. In 1799 Swartz, in his Muscorum Frondosorum (pp. 76 and 105), described *Polytrichum arcticum* and figured the capsule (tab. 8, fig. 17). This is short cylindric and somewhat curved, being $2\frac{1}{2}$ -3 times as long as broad — not including the lid. He says (l. c. page 106) "*Obs.* Differt a *P. alpino* L. (cui simillimum): *Capsulis* omnino absque apophysi basilaris. *Capsulae* in *P. alpino* ovatae, magisque cernuae." Lesquereux and James (1884), Limpricht (1893), Roth (1904), and others, emphasize the short (ellipsoidal, ovate, or ovoid) capsule in *P. alpinum* and the longer or cylindric capsule in *P. arcticum* (*P. alpinum* var. *arcticum*).

I have seen no New England material with the elliptic or ovoid

capsules. All specimens examined have the cylindric capsules of varying lengths, while the gametophyte is usually much less branched than in European specimens of the species which have been examined, and often unbranched. It will be of interest to learn to what extent the species, as briefly characterized above, is known in New England and elsewhere in North America. At present it would seem that the variety is far more common than the species if indeed the latter occurs at all. Although the species has been reported from Maine, New Hampshire, Vermont, and Massachusetts it seems highly probable that these reports were based largely, if not wholly, upon specimens of the var. *arcticum* as here characterized. For this reason these reports are not recorded in the preceding list.

No species in the list has been more difficult to interpret than *Polytrichum commune* with its many forms and variations. The species, as described by Dillenius, Linnaeus, Bruch and Schimper, Dixon, Limpricht, Roth, Lesquereux and James, and others, appears to be much less common than has been generally supposed. It is impossible at the present time to place satisfactorily some of the forms of this species, yet certain conclusions have been reached which would seem to justify preliminary publication, especially as it is very desirable that the attention of collectors be called to the necessity of getting abundant material from various habitats and localities — more particularly perhaps from bogs, swamps, and other wet places. The writer would be very glad to get specimens from any and all parts of the country — especially from New England — with a view of attempting to clear up the uncertainty in regard to several varieties and forms, the identities of which are at present too problematical to appear in the above list. It is quite possible that the interpretation of *P. commune*, as outlined here, may have to be revised when more material is at hand. Briefly, *P. commune*, as here restricted, is the fairly tall plant of moist shaded places with the gametophyte normally at least 10 cm. high, stems mostly simple, leaves remote, the upper free part (blade) about 1 cm. long and appressed when dry but having the apex recurved and the shining leaf-bases conspicuous; seta 6–11 cm. and capsule 5 mm. (4–7) long; calyptra golden brown.

The var. *perigoniale* is a smaller plant (4–8 cm. high) of drier and more exposed situations, with leaves smaller and more crowded, so that, when dry and appressed, the leaf-bases are ordinarily not seen; seta and capsule shorter (the latter 3–4 mm. long). As a rule this

variety is darker colored in all its parts and more compact than is the species, suggesting a more xerophytic plant. The perichaetial leaves, although usually more conspicuous and more prominently hyaline, are not necessarily any larger than in the species. This variety undoubtedly occurs in Vermont though no record of its occurrence there has been found.

The var. *uliginosum* is just such a variation as might be expected in a very moist, well shaded, and humid situation; that is, with elongated and more or less flexuose stems, longer and more distant leaves. In the dried state a very pronounced character is the abruptly squarrose upper portion of the leaf, the apex of which is often somewhat recurved or even circinate. It should be expected in all the New England states.

From an examination of some thousands of leaf sections of *P. commune* and its allies during the past year it is quite evident that there is much more variation in the lamellae than might be expected from reading standard descriptions; for instance, the end cells in sections may vary from strongly crescentic to circular in the same leaf, depending respectively upon whether the section is cut near the middle of the leaf or down near the sheath. Likewise, the heights of the lamellae vary. Again, the lamellae of immature leaves differ from those of mature ones. The leaves and lamellae of new shoots differ from those of the old shoots when the amount of humidity or soil moisture is altered. This can easily be shown experimentally by transferring a plant from a moderately dry situation to a dish of water under a bell jar and later comparing the leaves of the new shoots with those of the old. The thickness of the outer wall of the end cell is also a variable quantity. In fact it is quite evident that certain external factors (climatic and edaphic as well as physiographic) play no small part in determining the form and structure of the lamellae, the leaves, and even the whole plant. The query suggests itself, "Are these factors alone wholly responsible for the existence of any of the varieties which have received distinctive names?" Here is a good field for experimentation.

Polytrichum formosum was reported from various New England states prior to 1885. Undoubtedly the bulk of the material so reported must be referred to *P. Ohioense* as has been repeatedly shown in various articles and catalogues since the date mentioned.

Polytrichum gracile was reported from Massachusetts and New

Hampshire in 1847 by William Oakes (Hovey's Magazine, **13**: 174). Dr. A. J. Grout writes me that the only specimens of this species which he has were collected in Vermont, so the New Hampshire locality mentioned in RHODORA (**1**: 53) is undoubtedly an error. The Vermont plants were collected on both Willoughby Mt., and on Mt. Mansfield by Dr. G. G. Kennedy.

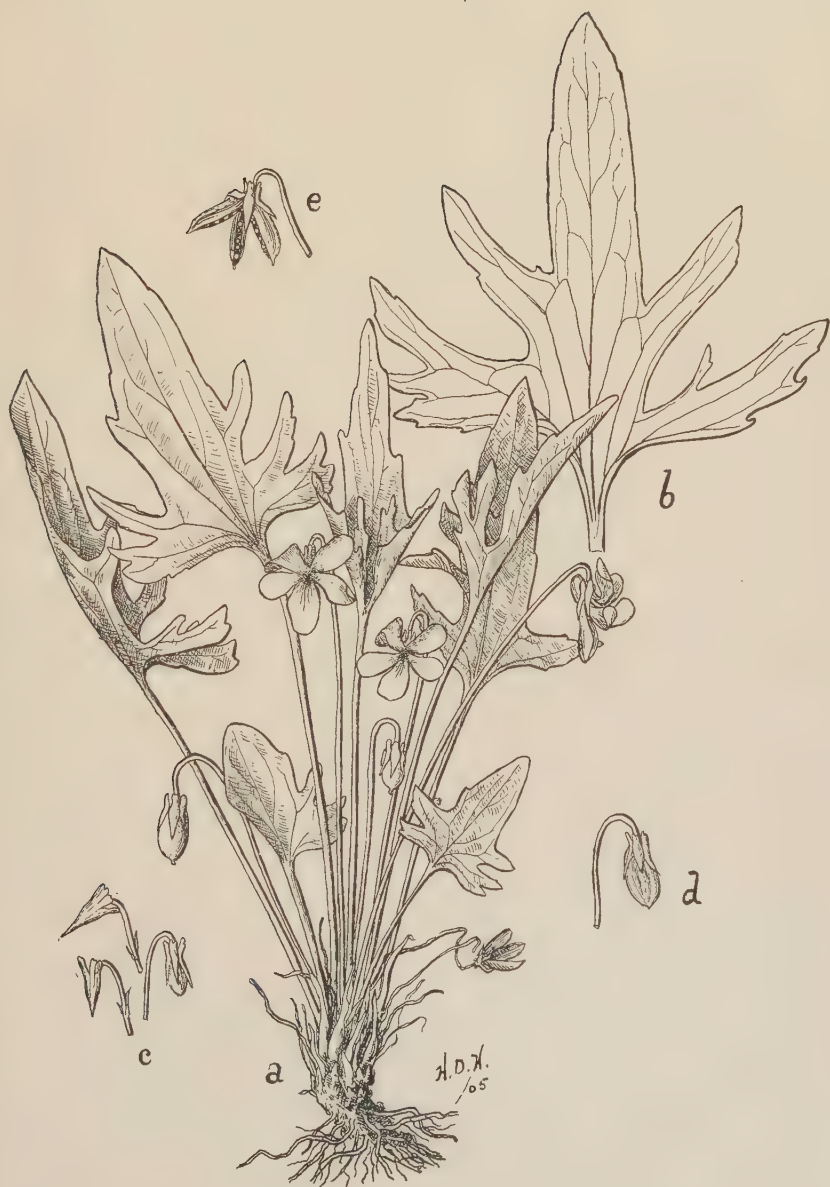
Polytrichum Jensenii is a plant which is known from Lapland, Finland, Spitzbergen, Greenland, Alaska, and the Yellowstone Park. The Maine plant which is here referred to this species grew amongst sphagnum in a bog at Presque Isle. It differs mainly from authentic material, kindly loaned by Mr. J. M. Holzinger, in having longer and somewhat flexuose stems, less rigid leaves, and thinner-walled marginal cells of lamellae.

BROWN UNIVERSITY.

BOTANICAL EXHIBITION AT THE MEETING OF THE NATURAL HISTORY SOCIETIES OF NEW ENGLAND.—At the recent meeting to form a Federation of the Natural History Societies of New England, held at the rooms of the Boston Society of Natural History, there was an exhibition which visiting botanists found of some interest. The Appalachian Mountain Club showed a small collection of plants from above the tree line on Mt. Washington. These were mounted under sheets of transparent celluloid in such a way that they could be conveniently handled and examined without danger to the specimens, thus obviating a risk to which herbarium sheets, exposed to public view, are usually liable. Miss Cora Clarke of the Science Club showed a number of sheets of mosses, some of which were arranged as records of particular days of collecting. Professor R. H. Richards of the same club showed some strikingly instructive photographs of trees and shrubs, which exhibited successive stages in the development of flowers and leaves and fruit. In particular, two series, one of the Wych Elm and the other of the American Elm, each consisting of ten views of twigs taken at weekly intervals, were of special value as botanical studies. Harry A. Cash exhibited the Ricker mounts for plants. Miss Ella L. Horr, for the Worcester Natural History Society, had a collection of Ferns, Club Mosses, and Mosses, mostly from Worcester County. The Botany Class of the

Teacher's School of Science exhibited by request the collection of mosses, before exhibited, prepared by a committee of the class. The specimens were mounted in "simplex" celluloid mounts, on cards, in such a way as to admit handling and study with a hand lens without injury to the plants. The class also exhibited certain plants suitable for growth in school rooms, though seldom seen there, to call attention to their value as illustrations of adaptation to desert and other conditions, and of methods of vegetative propagation. The Barton Chapter of the Agassiz Association contributed about one hundred and twenty named fresh mosses as part of the collection of three members during the month of April, 1906. Most of these were collected in three localities near Boston and where moisture was necessary were bedded in *Sphagnum*.—M. EDNA CHERRINGTON.

Vol. 8, no. 90, including pages 101 to 116, was issued 28 June, 1906.



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